

## **Appendix G. Master List of Species Likely to Benefit from Marine Protected Areas**

The Marine Life Protection Act requires that the Master Plan identify select species or groups of species likely to benefit from MPAs. Species likely to benefit from establishing an MPA are those whose home range, behavior, reproduction, exploitation rate or population status indicates that they may benefit from spatial management. This includes species that are directly targeted by fisheries, those which are caught incidental to fishing for the target species (bycatch) and which cannot be returned to the water with a high rate of survival, and those which may be indirectly impacted through ecological changes within MPAs. A reduction in removal of a species within MPAs has been shown worldwide to increase abundance, mean size, and reproductive potential of certain fished species<sup>1</sup>. These increases are seen primarily in fished species, though other species are also seen to increase.

An equally important consideration of whether a species may benefit is the tendency of individuals of a species, which are at or above harvestable size, to move, either ontogenetically (related to growth) or seasonally (related to spawning or migration cycles). Species with a strong tendency to move will not benefit significantly from the establishment of MPAs unless individual sites are large enough to encompass their entire range of movement. These include pelagic species such as northern anchovy, Pacific sardine, Pacific mackerel, jack mackerel, Pacific herring, and California market squid, highly migratory species such as albacore, tuna (bigeye, bluefin, yellowfin tuna, and skipjack), Pacific bonito, wahoo, opah, dolphin fish, swordfish, and striped marlin, most shark species (with the possible exception of smoothhounds, leopard, and angel sharks), and other migratory species, including chinook and cojo salmon, striped bass, yellowtail, barracuda, Pacific hake, and sablefish. However, establishing MPAs in areas which are known spawning grounds for such species would benefit stocks by allowing successful spawning by those sexually mature individuals which have not been harvested in open fishing areas.

Tables G-1 and G-2 include Californian marine species which are likely to benefit from the establishment of MPAs. The list includes both harvested species and other species that may benefit from MPAs due to reduced bycatch or habitat disturbance or enhanced ecological function due to increased abundance of harvested species. This list will be refined in each regional process to indicate which species are of particular concern and are most necessary to consider in the modification or design of MPAs.

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<sup>1</sup> Halpern, B.S. 2003. The impact of marine reserves: do reserves work and does reserve size matter? *Ecological Applications* 13(1) Supplement: S117-S137.

**Table G-1. Finfish Species Likely to Benefit from Marine Protected Areas**

<b>Species</b>	<b>Primary depth range (ft.)</b>	<b>Primary geographic range within state</b>	<b>Habitat preference juveniles</b>	<b>Habitat preference adults</b>	<b>Unique or significant life-history characteristics</b>	<b>Larval type</b>	<b>Larval duration [potential dispersal]</b>	<b>Potential for adult dispersal</b>
Bass, barred sand	0-120	southern California mainland	soft bottom less than 30 ft, eel grass beds	sand bottom	aggregate over sand in summer – early fall for spawning	planktonic	3-4 weeks	moderate
Bass, giant sea	15-150	southern California mainland and islands	rocky reefs, kelp beds, sand bottom	rocky reefs, kelp beds, sand flats	aggregate for several months during spawning	planktonic	one month; settle at ~ ¾ in.	moderate
Bass, kelp	0-75	southern California mainland and islands (uncommon central Calif.)	rocky reefs, kelp beds, eel grass beds	rocky reefs, kelp beds	aggregate in kelp beds and over rocky reefs for spawning in late May- September	planktonic	28-30 days	moderate
Bass, spotted sand	0-200	Santa Monica Bay and south	sand, mud, jetties, eel grass beds	soft bottom, kelp forests, eel grass beds, jetties	aggregate near bays to spawn in summer	planktonic	25-31 days	low
Blacksmith	0-150	southern California (to Monterey Bay)	rocky reefs	rocky reefs, kelp beds	demersal eggs in nests; defended by male	planktonic	short to moderate	moderate
Bocaccio	0-1050	All	over hard and soft bottom	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Cabazon	0-250	All regions, including islands	rocky reefs, breakwaters, kelp beds, tide pools, open ocean	rocky reefs, kelp beds	eggs adhesive, attach to substrate, often macroalgae	planktonic	3-4 months	low
Chilipepper	0-1080	All	soft bottom	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Corbina, California	0-45	southern California mainland	soft bottom, nearshore including surf zone	soft bottom, surf zone and bays	growth rate faster in estuaries; spawn offshore	planktonic	short	low
Cowcod	68-1200	All	soft and hard bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low

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Croaker, black	0-150	southern California mainland	soft bottom, nearshore including surf zone	soft bottom, surf zone; occasionally rocky reefs	one of few croakers to prefer rocky reefs and kelp beds	planktonic	short	low
Croaker, white	0-420	All; most common Point Reyes to Mexico border	near bottom in shallow soft habitat	soft bottom, primarily nearshore and estuaries	schooling; multiple spawning each year; adults in deeper water than juveniles	planktonic; larvae become epibenthic	short	low
Croaker, yellowfin	0-150	mainland, Pt. Conception south	soft bottom, nearshore and estuaries	soft bottom, beaches and piers, estuaries, kelp beds	spawning primarily in summer	planktonic	short	low
Eel, wolf	Intertidal to 600	northern and central California	pelagic	rocky reefs, kelp beds	not a true eel; spawn Oct.-February	planktonic ?	1-2 months	moderate
Flounder, starry	Shallow - 900	northern and central California	estuaries and bays, nearshore soft bottom	soft bottom; estuaries and bays to upper slope	spawn near river mouths and in estuaries and bays	planktonic	25-75 days	moderate
Garibaldi	0-95	southern California	rocky reefs, kelp beds	rocky reefs, kelp beds	males guard eggs, attached to red algae	planktonic	unknown	low
Goby, bluebanded	0-210 incl. intertidal	southern California (uncommon to Monterey)	rocky reefs	rocky reefs, kelp beds	males guard eggs, attached on brood chambers	planktonic	unknown	low
Goby, zebra	Intertidal to 200	southern California	rocky reefs	rocky reefs, usually in crevices and caves	demersal eggs, attached to roof of shelter	planktonic	unknown	low
Greenling, kelp	0-150	northern and central California	rocky reefs, kelp beds	rocky reefs, kelp beds	eggs adhere to rocky substrate	planktonic	unknown	moderate
Greenling, rock	shallow	northern and central California	rocky reefs, kelp beds	rocky reefs, kelp beds	eggs adhere to rocky substrate	planktonic	unknown	moderate

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Grunion, California	0-60	southern and central California	sandy nearshore areas	sandy nearshore areas	eggs deposited on sandy beaches; lack filaments	planktonic	low to moderate	moderate
Guitarfish, shovelnose	0-50	southern and central California	as adults	shallow sand or mud, open coast, bays, and estuaries	live-bearing	benthic	none	moderate
Hagfish, Pacific	30-3096	All	?	soft bottom	deposit egg cases	?	unknown	moderate
Halfmoon	0-130	southern California	rocky reefs, kelp beds	rocky reefs, kelp beds	regulates kelp growth by grazing	planktonic	unknown	moderate
Halibut, California	0-300	All	estuaries, shallow open coast soft bottom	estuaries and soft bottom open coast	distribution influenced by El Niño events	planktonic	< 30 days	moderate
Jacksmelt	shallow	All	kelp and eel grass beds; sandy beaches; harbors	kelp and eel grass beds; sandy beaches; harbors	eggs with filaments for attachment to eel grass and shallow algal beds	planktonic	low	moderate
Lingcod	0-1400	All	rocky reefs, kelp beds, hard bottom, soft bottom	rocky reefs, kelp beds, hard bottom, soft bottom	Spawns nearshore on rocky reefs; males guard eggs	planktonic	3 months	high
Lizardfish, California	5-750	southern and central California	primarily soft bottom	primarily soft bottom	rest on bottom using pelvic fins	planktonic	unknown	moderate
Midshipman, plainfin	0-1000	All	soft bottom	soft bottom; spawn on hard substrate	Eggs deposited on rocks and hard substrate	planktonic	unknown	moderate
Opaleye	0-95	southern and central California	rocky intertidal	rocky reefs, kelp beds	regulates kelp growth by grazing	planktonic	unknown	moderate
Pacific ocean perch	180-2100	All	midwater over hard bottom	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Pacific pompano (Butterfish)	30-300	All	coastal pelagic	coastal pelagic	a schooling species;	planktonic	unknown	moderate

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Prickleback, monkeyface	0-80	northern and central California	rocky intertidal	rocky reefs, kelp beds	deposit eggs on rocky substrate	planktonic	low	low
Prickleback, rock	0-60	northern and central California	rocky intertidal	rocky reefs, shallow	deposit eggs on rocky substrate	planktonic	low	low
Queenfish	0-180	southern and central California	soft bottom	shallow water and sandy bottom; in bays and sloughs	spawn at night from March to September	planktonic	short	moderate
Ray, bat	0-150	All	shallow soft bottom; bays and estuaries	shallow sandy and rocky areas, including bays and estuaries; kelp beds	live-bearing	miniature adults	none	moderate
Rockfish, aurora	600-1800	All	soft bottom	hard and soft bottom	live-bearing	planktonic	moderate	moderate
Rockfish, bank	102-810	All	midwater	midwater over hard bottom, drop offs	live-bearing	planktonic	moderate	moderate
Rockfish, black	0-1200	northern and central California	soft bottom	rocky reefs, kelp forests	live-bearing	planktonic	moderate	moderate
Rockfish, black-and-yellow	0-120	southern and central California	shallow rocky reefs	shallow rocky reefs, kelp forests	live-bearing	planktonic	Low to moderate	low
Rockfish, blackgill	720-1800 (juv.<660)	All	soft bottom	hard bottom, soft bottom, canyons, steep drop offs	live-bearing	planktonic	moderate	moderate
Rockfish, blue	0-300	All	rocky reefs, kelp forests, soft bottom	rocky reefs, kelp forests	live-bearing	planktonic	moderate	moderate
Rockfish, brown	0-420	All	low-relief hard and soft bottom	low-relief hard and soft bottom	live-bearing	planktonic	low to moderate	low

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Rockfish, calico	60-840	southern and central California	soft bottom	hard bottom, sand-rock and mud-rock interface	live-bearing	planktonic	moderate	low
Rockfish, canary	0-900	northern and central California	soft bottom; sand-rock interface	midwater and near bottom over hard bottom	live-bearing	planktonic	moderate	moderate to high
Rockfish, China	36-420	northern and central California	rocky reefs	rocky reefs, kelp forests	live-bearing	planktonic	low to moderate	low
Rockfish, copper	0-600	All	rocky reefs and soft bottom	rocky reefs, kelp forests	live-bearing	planktonic	moderate	low
Rockfish, darkblotched	240-1800	All	soft bottom	soft and hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, flag	100-600	southern and central California	rocky reefs	rocky reefs, canyons	live-bearing	planktonic	Moderate	low
Rockfish, freckled	130-550	southern California	soft bottom	hard bottom	live-bearing	planktonic	Moderate	low?
Rockfish, gopher	0-180	southern and central California	rocky reefs	rocky reefs, kelp forests	live-bearing	planktonic	low to moderate	low
Rockfish, grass	0-150	All	shallow rocky reefs	shallow rocky reefs, kelp forests	live-bearing	planktonic	moderate	low
Rockfish, greenblotched	200-1300	southern and central California	soft bottom	hard and soft bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, greenspotted	160-660	southern and central California	soft bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, greenstriped	200-1320	All	soft bottom	low relief hard bottom, soft bottom	live-bearing	planktonic	moderate	moderate
Rockfish, halfbanded	192-1320	southern and central California	soft bottom	low relief hard and soft bottom, cobble	live-bearing	planktonic	moderate	moderate
Rockfish, honeycomb	90-250	southern California	soft bottom	hard bottom	live-bearing	planktonic	moderate	
Rockfish, kelp	0-150	southern and central California	kelp forests and rocky reefs	kelp forests	live-bearing	planktonic	moderate	low

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Rockfish, Olive	0-480	southern and central California	kelp forests, soft bottom	rocky reefs, kelp forests	live-bearing	planktonic	moderate	low
Rockfish, pink	250-1200	southern and central California	soft bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, pinkrose	325-960	southern and central California	soft bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, quillback	75-900	northern and central California	rocky reefs	rocky reefs	live-bearing	planktonic	moderate	low
Rockfish, redbanded	300-1560	All	soft bottom	soft and hard bottom	live-bearing	planktonic	moderate	low
Rockfish, redstripe	300-1200	northern and central California	hard bottom	hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, rosethorn	390-1800	northern and central California	soft and hard bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, rosy	50-420	All	soft and hard bottom	hard bottom	live-bearing	planktonic	moderate	low
Rockfish, sharpchin	300-1050	All	hard bottom	hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, shortbelly	0-930	All	midwater over hard bottom	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, speckled	100-1200	All	hard bottom	hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, splitnose	700-1560	All	soft bottom	hard bottom, canyons	live-bearing	planktonic	moderate	moderate
Rockfish, squarespot	60-600	All	hard bottom	hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, starry	80-900	southern and central California	hard bottom	hard bottom	live-bearing	planktonic	moderate	low
Rockfish, stripetail	192-1320	All	soft bottom	soft and hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, swordspine	250-1420	southern and central California	soft bottom	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, tiger	200-900	northern and central California	hard bottom	hard bottom	live-bearing	planktonic	moderate	low

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Rockfish, treefish	0-150	southern and central California	rocky reefs	rocky reefs, kelp forests	live-bearing	planktonic	moderate	low
Rockfish, vermillion	0-900	All	soft and hard bottom	wide depth range, rocky reefs, kelp forests, canyons	live-bearing	planktonic	moderate	low
Rockfish, widow	0-1200	All	midwater over hard bottom	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Rockfish, yelloweye	150-1200	northern and central California	rocky reefs	hard bottom, canyons	live-bearing	planktonic	moderate	low
Rockfish, yellowtail	0-1800	All	midwater	midwater over hard bottom	live-bearing	planktonic	moderate	moderate
Sanddab, Pacific	30-1800	All	soft bottom	soft bottom	may spawn twice a year	planktonic	unknown	moderate
Sargo	0-130	southern California	rocky reefs, kelp beds, sand	rocky reefs, kelp beds, sand bottom	broadcast spawners	planktonic	unknown	moderate
Scorpionfish, California	0-600	southern California	reef systems	hard and soft bottom	adults aggregate in 12 to 360 feet to spawn; eggs released in gelatinous masses that float to surface	planktonic	unknown	low
Sculpin, staghorn	0-300	All	soft bottom, estuaries	soft bottom, estuaries	abundant in San Francisco estuary	planktonic	unknown	moderate
Seabass, white	0-400	southern and central California occurs farther north during El Niño events	sandy area, estuaries, piers, jetties, kelp beds	kelp beds. rocky reefs, offshore banks, open ocean	adults aggregate in spring-summer during spawning	planktonic		high
Shark, brown smoothhound	0-360	All	bays and estuaries	soft bottom, bays and estuaries, nearshore	live-bearing	miniature adults	zero	moderate



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Shark, gray smoothhound	0-150	All	bays and estuaries	soft bottom, bays and estuaries, nearshore	live-bearing	miniature adults	zero	moderate
Shark, horn	0-492	southern California	rocky reefs, kelp beds	rocky reefs, kelp beds	lay egg cases	miniature adults	zero	moderate
Shark, leopard	0-300	All	enclosed bays and sloughs; kelp beds; shallow sandy areas	enclosed bays and sloughs; kelp beds; shallow sandy areas near reefs	aggregate in very shallow water to release young; live-bearing	miniature adults	zero	moderate
Shark, Pacific angel	3-600	southern and central California	flat, sandy bottoms;	flat, sandy bottoms; sand channels between reefs	live-bearing	miniature adults	zero	moderate
Sheephead, California	0-180	southern and central California	rocky reefs, kelp beds	rocky reefs, kelp beds	changes sex from female to male with size	planktonic	unknown	low
Skate, big	10-360	northern and central California	soft bottom	soft bottom, occasionally rocky reefs	young hatch from eggs in cases	miniature adults	zero	moderate
Skate, California	60-2200	All	soft bottom	soft bottom	young hatch from eggs in cases	miniature adults	zero	moderate
Skate, longnose	180-2040	All	soft bottom	soft bottom	young hatch from eggs in cases	miniature adults	zero	moderate
Smelt, night	0-420	northern and central California	soft bottom	shallow sandy coastal areas	spawn in surf zone at night	planktonic	low to moderate	moderate
Smelt, surf	shallow	northern and central California	soft bottom	shallow sandy coastal areas	spawn in surf zone in daytime	planktonic	low to moderate	moderate
Smelt, whitebait	0-180	northern and central California	soft bottom	shallow sandy coastal areas, bays, and estuaries	spawn in sandy subtidal areas	planktonic	low to moderate	moderate
Sole, Dover	60-3000	All	soft bottom, deep water	soft bottom, deep water	a portion of the stock migrates	planktonic	at least 1 year	moderate
Sole, English	60-1000	All	soft bottom, shelf	soft bottom	migrates, spawns at 200-360 ft	planktonic	6-10 weeks	moderate

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Sole, petrale	60-1500	All	soft and hard bottom, shelf	soft and hard bottom, shelf	migrates, spawns at 900-1200 ft	planktonic	unknown	moderate
Sole, rex	60-2100	All	Soft bottom, shelf and slope	soft bottom, shelf and slope	spawns at 300-900 ft	planktonic	at least 1 year	moderate
Sole, rock	50-1200	northern and central California	soft and hard bottom, shelf	soft and hard bottom, shelf	one of few flatfishes found on rocky bottom	planktonic	unknown	moderate
Sole, sand	5-312	northern and central California	Soft bottom, nearshore, estuaries	soft bottom, nearshore	one of few medium-large flatfish found inshore	planktonic	unknown	moderate
Sole, slender	250-1700	All	soft bottom, shelf and slope	soft bottom, shelf and slope	relatively abundant offshore species	planktonic	moderate	moderate
Surfperch, barred	0-240	southern and central California	beaches	beaches	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, black	0-130	All	rocky reef, kelp beds	rocky reef, kelp beds	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, calico	0-30	All	beaches	beaches	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, pile	0-150	All	rocky reefs, kelp beds, soft bottom	rocky reefs, kelp beds, soft bottom	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, rainbow	0-130	All	rocky reef, kelp beds	rocky reef, kelp beds	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, redbtail	0-60	northern and central California	beaches	beaches	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, rubberlip	0-150	All	rocky reefs, kelp beds, soft bottom	rocky reefs, kelp beds, soft bottom	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, shiner	0-480	All	estuaries, soft bottom, kelp beds, rocky reef	estuaries, soft bottom, kelp beds, rocky reef	bear live, free-swimming young	not applicable	not applicable	moderate to high(?)
Surfperch, striped	0-55	All	rocky reef, kelp beds	rocky reef, kelp beds	bear live, free-swimming young	not applicable	not applicable	moderate
Surfperch, walleye	0-60	All	beaches	beaches	bear live, free-swimming young	not applicable	not applicable	moderate

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Surfperch, white	0-140	All	rocky reefs, kelp beds, soft bottom	rocky reefs, kelp beds, soft bottom	bear live, free-swimming young	not applicable	not applicable	moderate
Thornyhead, longspine	1090-5000	All	deep hard and soft bottom	deep hard and soft bottom; slope	lack swim bladder; may survive after being brought to surface and released; spawn gelatinous floating egg masses	planktonic	unknown	moderate to high
Thornyhead, shortspine	84-5000+	All	deep hard and soft bottom	deep hard and soft bottom; slope	lack swim bladder; may survive after being brought to surface and released; spawn gelatinous floating egg masses	planktonic	unknown	moderate to high
Tomcod, Pacific	0-720	northern and central California	unknown	soft bottom	broadcast spawners; high fecundity	planktonic	unknown	moderate
Topsmelt	shallow	All	kelp and eel grass beds; sandy beaches, harbors	kelp and eel grass beds; sandy beaches, harbors	spawns in eel grass and algal beds, possibly kelp beds; eggs attach to spawning substrate by adhesive filaments	planktonic	low	moderate
Turbot, C-O	shallow-966	All	rocky reef, sand; shelf	rocky reef, sand; shelf	one of few flatfishes to occur in kelp beds	planktonic	unknown	moderate
Turbot, curlfin	25-1146	All	soft bottom	soft bottom; shelf	small mouth; difficult to catch with hook-and-line	planktonic	unknown	moderate
Whitefish, ocean	0-300	southern and central California	unknown	midwater over hard and soft bottom	responds favorably to El Niño conditions	planktonic	unknown	moderate

**Table G-2. Invertebrate, Alga, and Plant Species Likely to Benefit from Marine Protected Areas**

Species	Primary depth range (ft.)	Primary geographic range within state	Habitat preference juveniles	Habitat preference adults	Unique or significant life-history characteristics	Larval type	Larval duration [potential dispersal]	Potential for adult dispersal
<b>Invertebrates</b>								
Abalone, black	Intertidal	southern and central California	crevices in rocky reefs, kelp beds	rocky reefs, kelp beds	susceptible to withering syndrome disease	planktonic	4-7 days	low
Abalone, flat	20-70	All regions, including islands	crevices in rocky reefs, kelp beds	rocky reefs, kelp beds	generally a cryptic species	planktonic	4-7 days	low
Abalone, green	subtidal To 20	South, mainland and islands	crevices in rocky reefs, kelp beds	rocky reefs, kelp beds	feed on drift algae	planktonic	4-7 days	low
Abalone, pink	20-120	South, mainland and islands	crevices in rocky reefs, kelp beds. rock outcrops	rocky reefs, kelp beds. rock outcrops	generally occurs where water temp is above 14 C	planktonic	4-7 days	low
Abalone, pinto	subtidal to 70	northern and central California	crevices in rocky reefs, kelp beds	rocky reefs, kelp beds	commonly found at approx. 4-inch length	planktonic	4-7 days	low
Abalone, red	Intertidal to 80	All regions, including islands	crevices in rocky reefs, kelp beds, boulder outcrops, under canopy of red urchins	rocky reefs, kelp beds, boulder outcrops	largest abalone species in the world	planktonic	4-7 days	low
Abalone, threaded	20-80	South, mainland and islands	crevices in rocky reefs, kelp beds	rocky reefs, kelp beds	some consider it a subspecies of Pinto abalone	planktonic	4-7 days	low
Abalone, white	80-200	South, mainland and islands	exposed rocky areas	exposed rocky areas	maximum age estimated at 40 years	planktonic	4-7 days	low
Clam, California jackknife	Intertidal to	South, mainland and islands	sandy mud, estuaries	sandy mud, estuaries	occupies a permanent burrow	planktonic	unknown	low
Clam, chione (several species)	Intertidal to 165	South, mainland and islands	mud, sand, estuaries	mud, sand, estuaries	smooth chione subject to habitat loss due to harbor development	planktonic	unknown	low

<b>Species</b>	<b>Primary depth range (ft.)</b>	<b>Primary geographic range within state</b>	<b>Habitat preference juveniles</b>	<b>Habitat preference adults</b>	<b>Unique or significant life-history characteristics</b>	<b>Larval type</b>	<b>Larval duration [potential dispersal]</b>	<b>Potential for adult dispersal</b>
Clam, gaper (several species)	Intertidal to 150	All regions	sand, sand/mud, estuaries	sand, sand/mud, estuaries	may live to 17 years	planktonic	unknown	low
Clam, geoduck	0-360	All regions	sand/mud, estuaries	sand/mud, estuaries	individuals may exceed 10 pounds	planktonic	2 weeks	low
Clam, littleneck (several species)	Intertidal	All regions, including islands	cobble beds	cobble beds	prized food item	planktonic	unknown	low
Clam, Manila	Intertidal	All regions	sand/mud, estuaries	sand/mud, estuaries	introduced from Japan; important recreational species	planktonic	3 weeks	low
Clam, Pismo	Intertidal to 80	southern and central California	exposed sand	exposed sand	primary prey item of California sea otters	planktonic	pelagic phase 2-3 days	low
Clam, razor	Intertidal and shallow subtidal	northern and central California	exposed sand	exposed sand	individuals can bury themselves in 7 seconds	planktonic	8 weeks	low
Clam, softshell	Intertidal	northern and central California	mud	mud	may have been introduced with eastern oyster	planktonic	unknown	low
Clam, Washington (several species)	Intertidal to 100	All regions	sand/mud, estuaries	sand/mud, estuaries	known to concentrate paralytic shellfish poisoning toxin	planktonic	4 weeks	Low
Cockles	Intertidal to 660	All regions, including islands	sand, sand/mud, mud, estuaries	sand, sand/mud, mud, estuaries	one species may live to 16 years	planktonic	unknown	Low
Crab, box	0-1800	All regions, including islands	rocky reef, submarine canyons	rocky reef, submarine canyons	unknown	planktonic	unknown	unknown
Crab, brown rock	0-300	All regions, including islands	rocky reefs, kelp beds,	rocky reefs, kelp beds,	rock crabs may live 5-6 years	planktonic	3-4 months	moderate
Crab, Dungeness	0-300	northern and central California	sand, sand-mud, estuaries	sand, sand-mud	larvae may be transported more than 50 miles offshore	planktonic	105-125 days	moderate

<b>Species</b>	<b>Primary depth range (ft.)</b>	<b>Primary geographic range within state</b>	<b>Habitat preference juveniles</b>	<b>Habitat preference adults</b>	<b>Unique or significant life-history characteristics</b>	<b>Larval type</b>	<b>Larval duration [potential dispersal]</b>	<b>Potential for adult dispersal</b>
Crab, red rock	0-750	All regions, including islands	rocky reefs, submarine canyons	rocky reefs, submarine canyons	may co-occur with spot prawns	planktonic	3-4 months	moderate
Crab, sand	Intertidal	All regions, including islands	intertidal, shallow subtidal sand	intertidal, shallow subtidal sand	larvae may occur with Dungeness crab larvae	planktonic	unknown	low
Crab, spider (sheep crab)	20-410	southern California	rocky reefs, kelp beds	rocky reefs, kelp beds	cease molting after reaching maturity	planktonic	unknown	moderate-high
Crab, yellow rock	0-300	southern California	sand, soft bottom	sand, soft bottom	egg-bearing females may congregate in rock-sand interface habitat	planktonic	3-4 months	moderate
Cucumber, sea (several species)	0-300	All regions, including islands	rocky reefs, sand/mud	rocky reefs, sand/mud	do not form spawning aggregations	planktonic	51-91 days	low
Limpets	Intertidal to 100	All regions, including islands	rocky reefs	rocky reefs	some species may live 15 years	planktonic	less than 1 week	Low
Lobster, California	0- 240	South, mainland and islands	surf grass beds	rocky reef, kelp beds, eel grass beds	egg-bearing females generally found in shallow water	planktonic	5-9 months	moderate-high
Mussels (several species)	Intertidal to 130	All regions, including islands	rocky reefs, pilings	rocky reefs, pilings	bioaccumulator of toxins.	planktonic	1 month	Low
Octopus (several species)	Intertidal to 660	All regions, including islands	rocky reefs, kelp beds, soft bottom	rocky reefs, kelp beds, soft bottom	eggs are attached to substrate and brooded by females	planktonic	1 month or less	Low
Prawn, ridgeback	145-525	South; mainland and islands	sand, shell, green mud	sand, shell, green mud	positive response to El Niño conditions	planktonic	unknown	low
Prawn, spot	150-1,600	All regions, including islands	shallower mud, mud-sand, sand/rock. rocky reef, submarine canyons	mud, mud-sand, sand/rock. rocky reef, submarine canyons	change sex from male to female during year 4	planktonic	unknown	moderate

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Scallop, rock	Intertidal to 100	All regions, including islands	rocky reefs, pier pilings, rock jetties	rocky reefs, pier pilings, rock jetties	intolerant of salinity less than 25 ppt	planktonic	5 weeks	Low
Sea hare (two species)	0-60	southern and central California	hard and soft bottom, kelp beds	hard and soft bottom, kelp beds	large nerve ganglia make them useful for research	planktonic	4-5 weeks	Low
Sea stars (many species)	Intertidal to deepest canyons	All regions, including islands	rocky reefs, hard bottom, sand	rocky reefs, hard bottom, sand	some species adapted to exposure at low tides	planktonic	unknown	Low
Shrimp, bay (several species)	0-575	All regions	soft bottom, estuaries	soft bottom, estuaries	major prey item for fishes	planktonic	30-40 days	low-moderate
Shrimp, coonstripe	60-600	northern and central California	sand, gravel, rocky reef, submarine canyon	sand, gravel, rocky reef, submarine canyon	change sex from male to female during year 1 or 2	planktonic	unknown	moderate
Shrimp, ghost and mud shrimp (several species)	Intertidal	All regions	sand, sand/mud, sand/gravel	sand, sand/mud, sand/gravel	form permanent burrows or impermanent tunnels	planktonic	unknown	low
Shrimp, ocean	150-1200	northern and central California: Oregon border to Pt. Arguello	green mud, mud-sand	green mud, mud-sand	change sex from male to female during year 2	planktonic	2.5 to 3 months	moderate
Snail, moon	Intertidal to 500	All regions, including islands	soft bottom	soft bottom	has aquiferous system of spongy sinuses in foot	planktonic	2 weeks	low
Snail, top (several species)	0-100	southern California	rocky reefs, kelp beds, including canopy	rocky reefs, kelp beds, including canopy	common in upper kelp canopy	planktonic	unknown	low
Snail, turban (several species)	Intertidal to 250	All regions, including islands	shallower rocky reefs, kelp beds, including canopy	rocky reefs, kelp beds, including canopy	feeds primarily on kelp and coralline algae	planktonic	unknown	low

Species	Primary depth range (ft.)	Primary geographic range within state	Habitat preference juveniles	Habitat preference adults	Unique or significant life-history characteristics	Larval type	Larval duration [potential dispersal]	Potential for adult dispersal
Squid, market	0 to at least 600	southern and central California	over soft bottom	over soft bottom	short-lived; average squid in commercial fishery is ½ year old.	planktonic	unknown	high
Urchin, purple	0-300	All regions, including islands	rocky reefs, kelp beds, under canopy of adults	rocky reefs, kelp beds	require high densities for successful spawning	planktonic	6-8 weeks	low
Urchin, red	Intertidal to 400	All regions, including islands	rocky reefs, kelp beds, under canopy of adults	rocky reefs, kelp beds	require high densities for successful spawning	planktonic	6-8 weeks	low
Urchin, white	0-990	South, including islands	sand, eel grass beds	sand, eel grass beds	extremely efficient grazers on smaller algae	planktonic	30-60 days	low
Whelk, Kellet's	0-230	South, including islands	rocky reefs, kelp beds, gravel, sand	rocky reefs, kelp beds, gravel, sand	spawning aggregations of up to 20 individuals occur in spring	planktonic	unknown	low
Worms (polychaetes)	Intertidal to deepest canyons	All	rocky reefs in mussel beds, cobble beds, soft bottom	rocky reefs in mussel beds, cobble beds, soft bottom	several species have toothed proboscis	planktonic	variable	low
<b>Algae and Plants</b>								
<i>Gelidium</i> sp. (many species)	Intertidal, to 100	All regions, including islands	rocky reefs	rocky reefs	may form mats of algal turf	not applicable	not applicable	none
<i>Gracilaria</i> sp. (many species)	Intertidal to 50	All regions, including islands	soft bottoms	soft bottoms	used as spawning substrate by herring in SF Bay	not applicable	not applicable	none
Kelp, bull	10-70	northern and central California	on rock or cobble substrate	on rock or cobble substrate	found where water temp is < than 60 F	not applicable	not applicable	none
Kelp, giant	20-120	southern and central California	on sand and rock substrate	on sand and rock substrate	fronds may grow up to 24 inches per day	not applicable	not applicable	none
<i>Porphyra</i> sp. (many species)	Intertidal to 100	All regions, including islands	rocky reefs	rocky reefs	may be common in high-energy surf zones	not applicable	not applicable	none



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Sea palm	Intertidal	northern and central California	exposed rocky reefs	exposed rocky reefs	individuals can regenerate blades but not stipe.	not applicable	not applicable	none
<i>Zostera marina</i> (eel grass)	5-20	All regions including islands	shallow sheltered mud and sand	shallow sheltered mud and sand	flowering plant	not applicable	not applicable	none